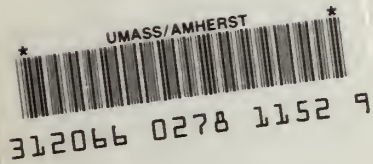


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COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

August 19, 1988

MOTOR VEHICLE PROPOSAL
FOR
FEDERAL-AID (HPR) PROJECTS

884 26

I. INTRODUCTION:

The Bureau of Transportation Planning and Development (BTP&D) was established in 1964 by an act of the Legislature to conduct transportation planning activities in the Commonwealth of Massachusetts. The BTP&D's responsibilities have increased over the years to include many additional field data gathering activities.

Vehicle transportation problems are always a factor when field activities are scheduled to take place. These problems have increased over the past several years for a variety of reasons, including high mileage usage, age of the fleet, expanding work programs, and new data gathering procedures and the resulting equipment. Many Federal Highway Administration (FHWA) mandated work activities required of the Department have been curtailed and in some cases postponed due to these problems, including the following programs:

- Statewide Traffic Data Collection
- Traffic Analysis and Forecasting
- Vehicle Classification
- 55 MPH Speed Enforcement
- Road Inventory
- Highway Performance Monitoring System
- Pavement Management and Skid Testing
- Weigh-in-Motion

The end result of the current non-replacement policy of aged high mileage vehicles is their final breakdown and being put out-of-service, with the inevitable shutting down of our entire field data gathering operations.

II. Proposed Solution to Transportation Problems.

The overall benefit that will be derived by adopting the proposed system recommended in this report will be a more efficient and cost effective Highway Planning and Research (HPR) data collection program. The HPR annual program is the mechanism for carrying out the programs listed above. The Pavement Management and Weigh-In-Motion programs are of particular importance, since they are currently being integrated as high priority required work items.

This proposal outlines what all parties involved in the work program consider to be the best solution to the transportation problems described above. That solution is the replacement of the current aging vehicle fleet with new vehicles, while adding at the same time sufficient additional vehicles to more efficiently allow BTP&D personnel to carry out their FHWA mandated programs. It is proposed to purchase twenty five (25) vehicles under the FHWA/MDPW HPR work program. This will include eighteen (18) full sized vans and seven (7) passenger cars.

III. PROPOSED TRANSPORTATION SYSTEM FOR HPR PROJECTS

This vehicle acquisition solution to the transportation problem is composed of four (4) types of costs:



A. VEHICLE PURCHASE COST

7 Chevrolet Celebrities @ \pm \$9,500	- - - - -	\$66,500
18 Chevrolet or Dodge Vans @ \pm \$11,000	- - - - -	<u>198,000</u>
Total purchase price	- - - - -	264,500
Cost per year (Purchase price amortized for 4 years)	- - - - -	66,125

B. FUEL COST [Requires an increase in MVMB fuel account (1102-5211-10)]

25,000 miles/year estimated x 25 vehicles	- - - - -	625,000 miles/year
625,000 miles \div by estimated 24 MPG	- - - - -	26,042 gallons/year
26,042 gallons x \$.65 per gallon	- - - - -	\$16,927 per year

C. REPAIR AND MAINTENANCE

\$330 average cost x 25 vehicles	- - - - -	\$8,250 per year
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D. MISCELLANEOUS COSTS

Agency miscellaneous costs are made up of administrative costs, fringe benefits, rental overhead, car washes and license plates.

(1) ADMINISTRATIVE COSTS:

\$408,111 MVMB administrative costs \div 1,910 total vehicles in MVMB =
\$213.67 per vehicle per year.

25 vehicles x \$213.67 pro-rata cost per year = - - - \$5,342 per year

(2) FRINGE BENEFITS:

\$315,956 administrative salaries X 41% established benefit*
= \$129,542

\$129,542 \div 1,910 (vehicles) = \$67.82 per vehicle
25 vehicles x \$67.82 = - - - - - \$1,696 per year

(3) RENTAL OVERHEAD:

2,024 sq. ft. office space x \$7 per sq. ft. = \$14,168 per month

\$14,168 cost per month x 12 months per year = \$170,016 per year

\$170,016 \div 1,910 total vehicles = \$89.01 per vehicle

25 vehicles x \$89.01 = - - - - - \$2,225 per year

* Established benefit figure from Budget Bureau.

(4) CAR WASHES:

\$4 per car wash x 2 per month = \$8 per month per vehicle
 \$8 x 12 months per year x 25 vehicles = - - - - - \$2,400 per year

(5) REGISTRATION PLATES:

\$1.40 per plate x 2 plates per vehicle x 25 vehicles = \$70.00
 Cost per year = \$70.00 the first year and zero (0) for years 2, 3 and 4, for an average cost of \$18 per year over four (4) years.

IV. Cost Summary

The total cost per year to implement the new system would be a combination of that year's amortized vehicle purchase cost, fuel cost, repair and maintenance costs and miscellaneous costs items III A through D above. These are summarized below:

A. Purchase Price (amortized over 4 years) - - - - -	\$66,125
B. Fuel Costs - - - - -	16,927
C. Repair & Maintenance Costs - - - - -	8,250
D. Miscellaneous Costs - - - - -	11,681
1. Administrative Costs - - - - -	\$ 5,342
2. Fringe Benefits - - - - -	1,696
3. Rental Overhead - - - - -	2,225
4. Car Washes - - - - -	2,400
5. Registration Plates - - - - -	<u>18</u>
Subtotal miscellaneous - - - - -	\$11,681
Total amortized Yearly Cost - - - - -	\$102,983

The actual yearly cash flow cost of implementing this program is shown below:

Item	<u>1</u>	<u>2</u>	<u>Year</u> <u>3</u>	<u>4</u>	<u>Total</u>
Vehicle Purchase*	\$264,500	0	0	0	\$264,500
Fuel**	16,927	16,927	16,927	16,927	67,708
Repair, Maintenance and	19,931	19,931	19,931	19,931	79,724
Miscellaneous costs***					
Totals	<u>\$301,358</u>	<u>\$36,858</u>	<u>\$36,858</u>	<u>\$36,858</u>	<u>\$411,932</u>

* Excludes trade in value.

** Based upon 25,000 miles/year and 24 miles/gallon.

*** Includes items IV.C&D.



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V. FHWA REIMBURSEMENT TO THE COMMONWEALTH

The Commonwealth will be reimbursed at the normal FHWA HPR rate for the purchase price and the operating costs of the vehicles in a manner similar to that presently used by the DPW for other MVMB leased vehicles. A daily administrative charge* will be levied for each vehicle used for Federal-Aid HPR Projects. These charges will be paid to the General Fund by the FHWA through the DPW and will consist of adequate funding over the life of the vehicle to pay for the purchase, fuel, repair, maintenance and miscellaneous costs.

* Administrative charges include fuel, repair, maintenance and miscellaneous costs.

VI. DAILY ADMINISTRATIVE CHARGE

The daily administrative charge is composed of items IV.B through D as listed above. These are:

Fuel

25,000 miles/vehicle/year \div 24 miles/gallon X \$0.65/gallon \div 365 days/year
= \$1.86/vehicle/day

Repair and Maintenance = \$8,250/year total for all vehicles

Miscellaneous costs = \$11,681/year total for all vehicles

Total = \$19,931/year total for all vehicles

\$19,931/year - 25 vehicles - 365 days/year = \$2.18

Total administrative charge = \$1.86 + 2.18 = \$4.04/Vehicle/day

VII. Benefits of Proposed System

The major benefits to be derived by adopting this system are many, including:

- elimination of chronic breakdowns and "lost day" trips to repair shops
- deadlining of vehicles with chronic mechanical problems to "out-of-service" status.
- more efficient use of personnel
- elimination of constant shifting of vehicles and personnel in order to provide the most dependable vehicles for the longest trips
- allow the breaking up of crews into smaller units when jobs allow, resulting in more personnel efficiency

- more work production
- allow for the addition of new programs such as Pavement Management, Vehicle Classification and Weigh-In-Motion.

The overall benefit to be derived by adopting this proposal will be a more efficient and cost effective HPR program. Since this proposal will directly affect the HPR program work activities related to traffic data collection and analysis, road inventory, HPMS and pavement management, the improvements to efficiency in these areas will be greatly improved. A cost effective program cannot be run with broken down undependable vehicles constantly interrupting planned work activities. The purchase of a new vehicle fleet will not only improve the current program but allow for our FHWA mandated expansion into the Pavement Management, Vehicle Classification, and Weigh-In-Motion areas.

CONCLUSION:

The current transportation system is extremely costly both in terms of personnel and dollar cost due to the poor condition of the current fleet of vehicles. If these vehicles are not replaced there will be increased down time of employees assigned to these programs, increased maintenance costs to keep these vehicles in operation, and constant interruption of the program. This proposed system will increase the productivity of the employees and create a more cost effective program.

